

CLAIMS

What is claimed is:

1. An electrical optical array comprising:
  - a wiring board having a first plurality of openings therethrough and having first and second substantially opposite surfaces;
  - a second plurality of contact pads disposed on said wiring board;
  - a third plurality of LEDs each restrainably coupled within one of said first plurality of openings and having a third surface extending beyond said first surface and having a fourth surface exposed through said second surface;
  - at least one electrical lead extending from each of said third plurality of LEDs to at least one of said second plurality of contact pads; and
  - a heat sink thermally coupled to said third surface of each of said third plurality of LEDs.
2. The array of claim 1 further comprising a thermally conductive layer between the heatsink and said third surface of at least some of said third plurality of LEDs.
3. The array of claim 1 wherein the contact pads are on the first surface of the wiring board.
4. The array of claim 1 wherein the at least one electrical lead extends laterally from the LED in a general direction approximately parallel to said third surface.

5. The array of claim 3 further comprising a thermally conductive and electrically insulating layer between the at least one electrical lead of at least some of the LEDs and the heatsink.

6. An electrical assembly comprising: an electronic device having a top, a bottom and electrical leads; a heatsink; and a wiring board with a through-hole for receiving the device such that its bottom is in thermal contact with the heatsink and its top protrudes through the wiring board and its leads are captured between a portion of the wiring board and the heatsink.

7. The assembly of claim 6 wherein the heatsink has a substantially planar upper surface and the wiring board is substantially parallel therewith.

8. The assembly of claim 6 further comprising a thermally conducting, electrically insulating resilient layer located between the electrical leads and the heatsink.

9. The assembly of claim 6 wherein the device is a surface mount semiconductor device whose leads protrude laterally therefrom between its top and bottom.

10. The assembly of claim 9 wherein the leads are attached to conducting regions on a lower surface of the wiring board facing toward the heatsink.

11. The assembly of claim 6 wherein the leads are attached to conductive regions on an upper surface of the wiring board facing away from the heatsink.

12. The assembly of claim 6 wherein the wiring board has a first portion closer to the heatsink on which are located contact regions to which the leads attach and a second portion overlying the first region at least in part and wherein the leads are captured between the first or second portion and the heatsink.

13. The assembly of claim 6 wherein the through hole in the wiring board has a first diameter through a first portion of the wiring board and a second diameter less than the first diameter through a second, superposed, portion of the wiring board.

14. The assembly of claim 13 wherein the first portion of the wiring board lies closer to the heatsink than the second portion.

15. The assembly of claim 13 wherein the device has a body region with an outer diameter less than the first diameter and greater than the second diameter.

16. A method for forming an electrical assembly, comprising:

providing a heatsink;

providing an electronic device having a top portion, base portion and electrical leads

providing a wiring board with electrical contact regions and a hole extending between an upper surface and a lower surface of the wiring board;

installing the device on the wiring board such its top portion is exposed from the hole on the top surface, its bottom portion protrudes from the hole beyond the bottom surface and its electrical leads are attached to the electrical contact regions of the wiring board; and

placing the lower surface of the wiring board in close proximity to the heat sink such that the bottom portion of the device is in thermal contact with the heat sink and the electrical leads of the device are captured between a portion of the wiring board and the heat sink.

17. The method of claim 11 further comprising placing an electrically insulating thermally conducting layer between the wiring board and the heatsink.

18. The method of claim 11 further comprising clamping the wiring board to the heatsink.